St Helena Wirebird: the forgotten plover

Neil McCulloch

Le Pluvier de Sainte-Hélène *Charadrius sanctaehelenae* est la seule espèce terrestre endémique de Sainte-Hélène (Atlantique sud) qui survit à ce jour. La plupart des espèces disparues avaient totalement ou quasi-totalement perdu la faculté de voler, un trait qui n'est pas partagé par le Pluvier de Sainte-Hélène, ce qui a probablement contribué à sa survie face aux prédateurs introduits. Son écologie et son comportement étaient peu connus avant les années 1980. L'espèce fréquente les pâturages et les abords du semi-désert dans le nord et l'ouest de l'île, et pourrait avoir bénéficié de la déforestation qui accompagna la colonisation de Sainte-Hélène par l'homme, quoique son aire de répartition se soit probablement retrécie pendant la période de la culture de lin, de 1907 à 1966. L'espèce atteint sa plus grande densité dans des herbages de moyenne altitude (300–500 m); la densité est influencée par la présence de certaines proies invertébrées et la topographie, ainsi que par la pluviométrie et la structure de la végétation. L'oiseau affectionne les zones d'herbes basses (moins de 10 cm de hauteur) et sur pentes faibles. La période de nidification s'étend sur toute l'année, avec toutefois une pointe en octobre-février. Les deux œufs sont couvés par les deux sexes pendant environ 28 jours. Les jeunes peuvent voler à l'âge d'environ 5 semaines et s'assemblent en groupes lâches comptant jusqu'à 15 individus. Malgré la crainte que la population, qui comptait 450 individus au recensement de 1989, ait chuté de 20–30% depuis, à cause de la dégradation de l'habitat et la prédation, il n'est pas prouvé de façon certaine qu'un de ces facteurs ait augmenté significativement. Ainsi, la poursuite des recherches en la matière s'avère indispensable.

Ask a random sample of people what they know about St Helena and it is likely that a reasonable number will be aware of the island's connection with Napoleon Bonaparte. Considerably fewer will know where the island is and you would be extremely lucky to find anyone with knowledge of its flora and fauna. In many ways this is hardly surprising; the South Atlantic island of St Helena (15°56'S 5°42'W) is one of the most isolated islands in the world and was uninhabited until the 16th century. It is situated c1900 km west of Angola and 3300 km east of Brazil (Fig. 1). The nearest land is Ascension Island 1300 km to the north-west. Although St Helena covers only 122 km^2 and has maximum dimensions of 16 km x 10 km, its extreme isolation has been a catalyst in the development of a biodiversity to rival such evolutionary 'hot-spots' as the Galápagos and Aldabra[4,6].

Both Darwin and Wallace commented on the diversity of St Helena's endemic invertebrates and plants following visits to the island. It is also known that at least six endemic terrestrial bird species occurred there[2,11]. It is therefore a tragedy that—since its discovery—the island has been subjected to environmental degradation on a scale sufficient to extirpate much of its native flora and fauna.

St Helena, like most oceanic islands, had a volcanic origin and emerged from the sea c14 million years ago. There has, however, been no volcanic activity during the last seven million years. The island was discovered by the Portuguese navigator João da Nova Castella in 1502, when it was apparently heavily wooded. No permanent settlement was established on St Helena until 1659 but, during the intervening period, a variety of exotic domestic and pest species rapidly became established, either to support occasional human habitation or by accident[12]. Pigs and goats were present by 1536, the latter having possibly been introduced as early as 1513. By 1588, Captain Thomas Cavendish was able to see herds of 100s of goats during his visit to St Helena. Feral cats and dogs were present by 1634. Black Rats *Rattus rattus* probably first came ashore soon after the discovery of the island and were certainly a serious pest by 1666. Brown Rat *R. norvegicus* apparently became established in the 18th century. The ravages of goats was succeeded by a demand for timber for building and fuel which resulted in widespread and rapid deforestation, and catastrophic erosion of the unconsolidated soils. The consequences of this, and the introduction of non-indigenous

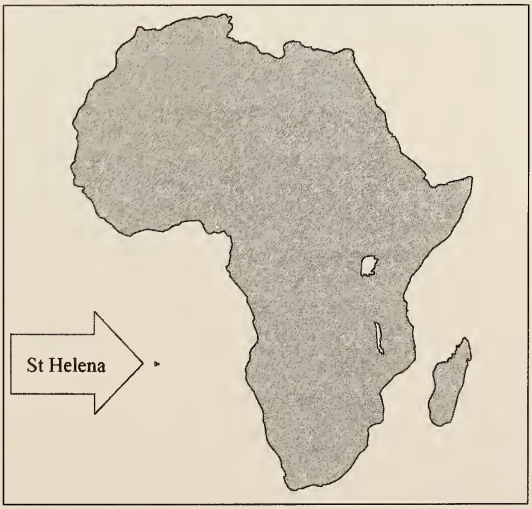


Figure 1. Location of St Helena.

predators, included the extinction of all the endemic landbirds with the exception of a plover *Charadrius sanctaehelenae*—known locally as the Wirebird—and severe reductions in the numbers and diversity of breeding seabirds. These extinctions appear to have been extremely rapid, within perhaps just 50 years. None of the lost species were described in life, being known only from skeletal material.

The present-day terrestrial avifauna of St Helena consists of 11 breeding species: Chukar *Alectoris chukar*, Common Pheasant *Phasianus colchicus*, Common Moorhen *Gallinula chloropus*, Wirebird, Feral Pigeon *Columba livia*, Peaceful Dove *Geopelia striata*, Common Mynah *Acridotheres tristis*, Madagascar Fody *Foudia madagascariensis*, Java Sparrow *Padda oryzivora*, Common Waxbill *Estrilda astrild* and Yellow Canary *Serinus flaviventris*. All but the Wirebird and Common Moorhen have been deliberately introduced[12].

The Wirebird

The Wirebird has the smallest range of any wader. It is closely related to Kittlitz's Plover *Charadrius pecuarius* of Africa, with which it undoubtedly shares a common ancestry, and they have often been treated as conspecific[3]. Although the Wirebird closely resembles *C. pecuarius*, it is substantially larger, paler and differs markedly in its physical proportions, eg its tarsus is c40% longer than *C. pecuarius* although the sternum is only 10% longer[11]. The bill is also disproportionately longer.

The Wirebird's wing is more rounded and its pectoral muscles relatively smaller than in *C. pecuarius*. More extreme examples of such trends are evident in the other endemic landbirds known from St Helena, most of which appear to have been flightless or to have had considerably reduced powers of flight[11]. The Wirebird's retention of efficient flight has undoubtedly assisted its survival in the face of introduced predators.

It is unknown when the Wirebird's ancestors first reached St Helena but bones analysed by Olson[11] appear to be at least 1,500 years old and some may date from the early Pleistocene. The birds from which these bones came were all larger than typical *C. pecuarius* suggesting that evolutionary divergence was relatively rapid.

The Wirebird was first described as a species in 1873[7], but little behavioural and ecological information was obtained until the 1980s[1,9,10]. St Helena's isolation has tended deter scientific investigation of its biology and most published data on the species are contained in the anecdotal writings of island residents or the observations of very short-term visitors.

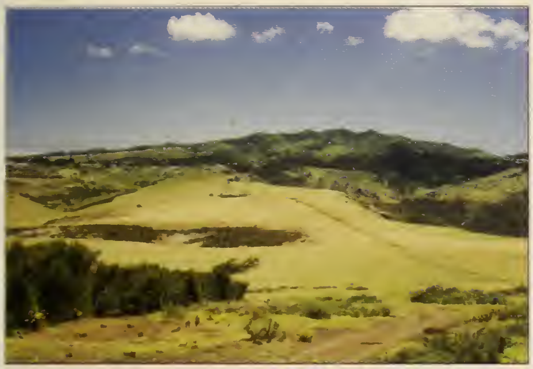
Habitat and distribution

The original habitat of the Wirebird is subject to controversy. The species currently inhabits pastureland and semi-desert fringes. Most early reports describe St Helena as being heavily wooded and it has been suggested that the Wirebird originally utilised the floor of endemic Gumwood *Commidendrum robustum* woodland, which typically has a very open litter layer. This would, however, be highly atypical habitat for a plover and the present-day population shows no affinity for woodland. It is probable that some areas on the west side of the island always consisted of semi-desert and scrub[6] and the more open parts were probably the original habitat of the ancestral Wirebirds. Such habitat could only have supported a very small population, which would have been unlikely to persist long enough to undergo substantial evolutionary divergence. It has recently been demonstrated, however, that, in the last Ice Age, sea-levels were considerably lower and St Helena would have possessed an extensive, gently sloping coastal plain (N. P. Ashmole pers. comm.), probably supporting a much larger population of plovers. Ironically, the Wirebird may have benefited from the widespread deforestation that led to the extinction of the other endemic birds.

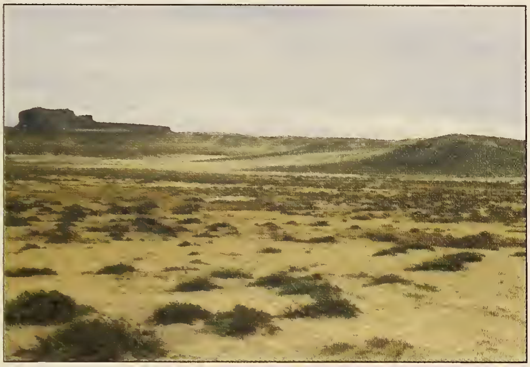
Maximum deforestation had probably occurred by the mid- to late 19th century, there being only 162 acres (65 ha) of woodland in 1884[1]. It seems reasonable to assume that Wirebird numbers reached their peak at this time.

Some contraction of range undoubtedly occurred following the establishment of a fibre industry based on New Zealand Flax *Phormium tenax* from 1907–1966. During this period, up to 40% of the pasture recorded in 1884 was given over to flax production. Since then, some of the former plantations have been returned to pasture but many have been converted to forest, probably resulting in a net loss of Wirebird habitat. Some former habitat has also been lost to housing and amenity development during the 20th century, particularly in the north-west of the island.

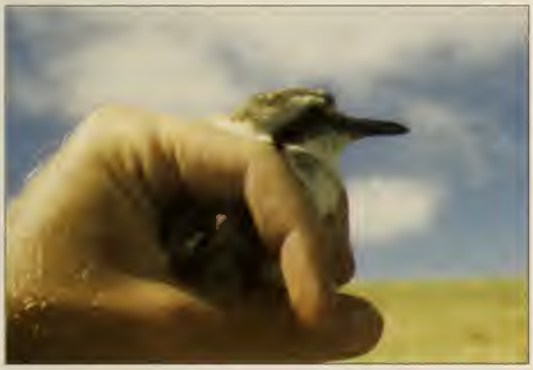
A 14-month study in 1988–1989 revealed a fragmented breeding distribution north and west of St Helena's central ridge (Fig. 2)[9,10]. Wirebirds utilise three broad habitat types: semi-desert (below 300 m), intermediate altitude grassland (300–500 m) and upland grassland (above 500 m). Intermediate grassland is the most important habitat. Wirebird density in intermediate grassland—0.36 birds per ha—was four times greater than that in semi-desert and three times that in upland grassland in 1988–1989. The most important breeding site—Deadwood Plain—in the north of the island is intermediate altitude grassland and supports 25–30% of the entire population. Population density closely matches that of the species' invertebrate prey—principally beetles and caterpillars—but is also influenced by topography, rainfall and vegetation structure. St Helena is predominantly mountainous but Wirebirds tend to avoid gradients steeper than 10%. Such topography characterises much of the upland grassland zone. It also prefers grass sward lower than 10 cm high. Higher rainfall in upland areas promotes



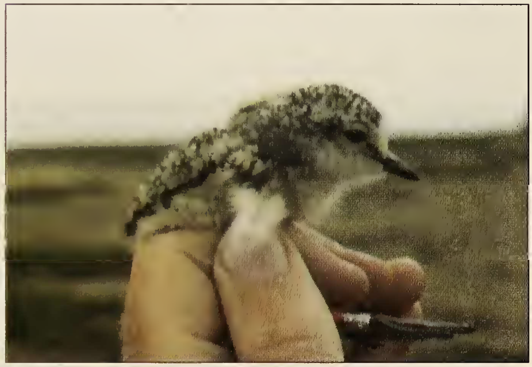
Deadwood Plain, from Flagstaff, 4 November 1989 (Neil McCulloch)



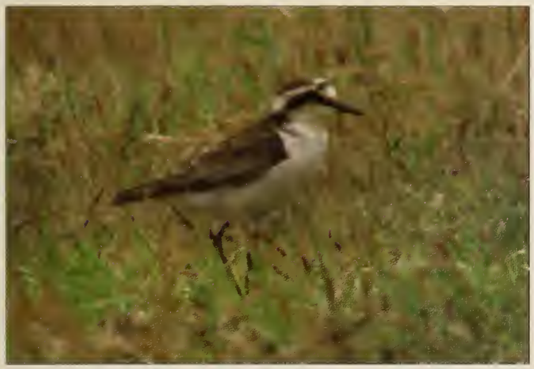
Prosperous Bay Plain with *Sueda helenae* scrub, 10 December 1989 (Neil McCulloch)



Adult St Helena Wirebird *Charadrius sanctaehelenae* (Neil McCulloch)



Downy young St Helena Wirebird *Charadrius sanctaehelenae* (Neil McCulloch)



Adult St Helena Wirebird *Charadrius sanctaehelenae* (Neil McCulloch)

lush year-round growth and contributes to low Wirebird useage. Although invertebrate density may be high in such areas, the tall, dense swards probably reduce their suitability for Wirebirds. It is also possible that the cooler, wetter climate at these elevations is less favourable for breeding.

Breeding

Adult Wirebirds are apparently extremely sedentary and strongly territorial for much of the year. The species breeds year-round but there is a distinct peak in nesting activity in the dry season (October–February). It appears to be monogamous and its breeding biology is typical of African sand plovers. Two eggs are laid in a simple scrape lined with dried grass blades and stolon fragments. Occasionally it nests among dry cow dung, as has frequently been recorded in Kittlitz's Plover. Incubation, in closely observed nests, is shared approximately equally between the sexes and takes c28 days. Wirebirds may incubate their eggs more intensively than has been recorded in some studies of Kittlitz's Plover in southern Africa. This is possibly an adaptation to the generally cooler conditions prevailing in St Helena than on much of the African mainland. The Wirebird shares with Kittlitz's Plover the trait of covering the eggs with nest lining material when disturbed. Wirebirds defend their nests against all bird species but their reaction toward Common Mynahs is particularly strong, suggesting that this species is a significant predator.

In contrast to many other plover species, which often lead their chicks considerable distances to feeding areas, Wirebirds apparently raise their young almost exclusively within the nesting territory. The chicks fledge at c5 weeks but may remain with their parents for a further period of unknown length. Many newly fledged juveniles form loose flocks of up to 15 birds and wander widely around the island, being subject to frequent harassment from territorial adults. Numbers of first-year Wirebirds spend much time loafing near the few areas of permanent water in the north-east of the island.

The number of Wirebird nesting attempts subject to detailed study is very small. In consequence, estimates of breeding success must be regarded as broad approximations. Of 28 nests of known outcome observed during 1988–1989, 39% produced at least one chick. Hatching success appears to be high (95%) in nests unaffected by predation. Minimum fledging rate, based on re-sightings of juveniles ringed as downy chicks, was 23%. A combination of survival parameters for the various stages of the nesting cycle gave an overall estimate of survival rate from egg to fledging of 19%[10]. This figure is similar to that obtained for a population of Kittlitz's Plover in Zimbabwe[13] but may be an overestimate.

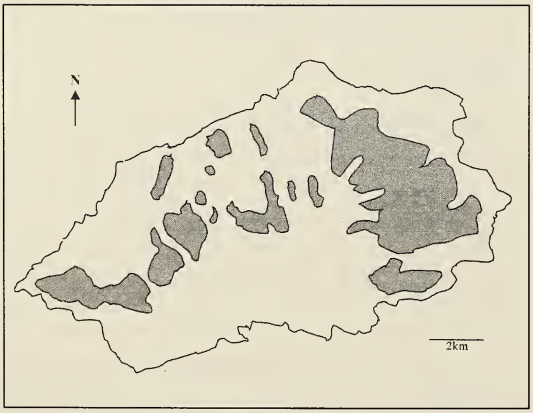


Figure 2. Map of St Helena showing breeding distribution of the Wirebird (shaded) in 1988–1989.

Status and conservation

The Wirebird is regarded with affection by St Helenians and suffers no human persecution. The species' status remained little-known until the late 1980s, previous population estimates having been very varied and generally conflicting[10]. Three censuses undertaken in 1989 of areas known or suspected to support breeding birds suggested a total population of c450 birds. More recent surveys of the same sites by local observers indicate a decline of 25–30%, leading to the species being re-classified from Vulnerable to Endangered[5].

The reasons for this apparently rapid reduction in Wirebird numbers are unclear. Predation and habitat degradation appear to be the most likely explanations. There is, however, no strong evidence of either having increased significantly since 1989.

Cats, dogs, rodents and mynahs are all abundant on St Helena but these have been present for several centuries without apparently causing such a decline in the Wirebird. The species retains a full repertoire of anti-predator behaviour including distraction displays and egg-covering. In recent years feral cats and dogs have been subject to more stringent control than ever before. Rats appear to be scarce at the major Wirebird sites, preferring more heavily vegetated areas. Mice can, on occasion, be significant predators of the eggs of ground-nesting birds[8], but no evidence of this has been found on St Helena, although mice have been implicated in the extinction of some of the island's larger endemic invertebrates. No information exists on recent population trends in Common Mynah on St Helena or on this species' impact on Wirebird nests. Both factors require investigation.

The majority of Wirebirds occur on grazing land and are vulnerable to any major change in land use or management practices in such areas which reduce the abundance or availability of prey or nest sites. No such changes have occurred since 1989 and those few developments that have impinged upon Wirebird sites have been on a scale too small to cause a major reduction in Wirebird numbers.

The most optimistic scenario is that the apparent decline may be an artefact of variation in census methods. The situation does, however, require urgent investigation. To meet this need, a three-year study of Wirebird ecology, organised by the University of Reading, commenced in August 1998. The project, funded by the UK Government's Darwin Initiative, is being undertaken in close co-operation with the Environmental Conservation Section (ECS) of St Helena's Department of Agriculture and Forestry. The research programme includes further census work and will attempt to identify threats to the species through an intensive study of the Wirebird's breeding biology and ecological requirements. An important component of the project will be the training of ECS staff in ornithological survey techniques and the establishment of a standardised monitoring programme for the Wirebird. The information obtained from this new study will be used to draw up a long-term species management plan.

The impact of European colonisation of tropical islands on indigenous avifaunas has been devastating. St Helena is an extreme example of this process. The Wirebird is the only remnant of a diverse community of landbirds that formerly existed on the island. It would be tragic if this species was also to disappear. St Helena is still very interesting biologically, despite the ravages of the past, and the Wirebird is widely recognised as an important component of that singularity. The species is featured on the island's coat of arms but, hopefully, increasing understanding of its biology will ensure that the Wirebird remains a living symbol of St Helena for centuries to come.

References

1. Alexander, C. 1985. The St Helena Wirebird: its status and distribution. Unpubl. ms.
2. Ashmole, N.P. 1963. The extinct avifauna of St Helena island. *Ibis* 103b: 390–408.
3. Bock, W.J. 1958. A generic review of the plovers (Charadriinae, Aves). *Bull. Mus. Comp. Zool.* 118: 27–97.
4. Brown, L.C. 1982. *The flora and fauna of St Helena.* Tolworth: Ministry of Overseas Development Project Report 59.
5. Collar, N.J., Crosby, M.J. and Stattersfield, A.J. 1994. *Birds to watch 2: the world list of threatened birds.* Cambridge, UK: BirdLife International.
6. Cronk, Q.C.B. 1989. The past and present vegetation of St Helena. *J. Biogeog.* 16: 47–64.
7. Harting, J.E. 1873. On rare or little known Limicolae. *Ibis* (Ser.3) 3: 260–269.
8. Maxson, S. and Oring, L. 1978. Mice as a source of egg loss among ground-nesting birds. *Auk* 95: 582–584.
9. McCulloch, M.N. 1991. Status, habitat and conservation of the St Helena Wirebird *Charadrius sanctaehelenae*. *Bird Conserv. International* 1: 361–392.
10. McCulloch, M.N. 1992. *The status and ecology of the St Helena Wirebird.* BTO Research Report No.97. Thetford: British Trust for Ornithology.
11. Olson, S.L. 1975. The palaeornithology of St Helena Island, South Atlantic Ocean. *Smithsonian Contr. Paleobiol.* 23.
12. Rowlands, B.W., Trueman, T., Olson, S.L., McCulloch, M.N. and Brooke, R.K. 1998. *The Birds of St Helena: an annotated checklist. BOU Checklist No.16.* Tring: British Ornithologists' Union.
13. Tree, A.J. 1974. A comparative ecological study of Kittlitz Plover and Treble-banded Plover at Lake McIlwaine. Salisbury: M.Sc. thesis, University of Rhodesia.

29 Cuddyside, Peebles, Borders EH45 8EN, UK.

Advertise in the *Bulletin of the ABC*

All advertisements must be sent **prepaid** (cheques made payable to the African Bird Club) as camera-ready copy, bromide/film or on floppy disk to:

Moira Hargreaves, 30 Highfield Road, Tring,
Herts, HP23 4DX, UK.

If adverts are sent on floppy disk we can accept Pagemaker 6, CorelDraw7 files or unformatted ASCII text files and uncompressed TIF graphics files. If adverts are prepared on an Apple Mac the diskette should be formatted for PC.

The current rates are as follows and are based on a print run of 1,500 copies. These rates are guaranteed for the September 1999 *Bull ABC.*

Please address all queries to Moira Hargreaves at the above address.

African Bird Club Advertising Rates

Black & white

Full-page	£95	(210 x 145mm)
Half-page	£60	(100 x 145mm)
Quarter-page	£40	(100 x 70mm)
Eighth-page	£25	(50 x 70mm)

Colour

Please contact Moira Hargreaves on Tel/Fax: 01442 823624. E-mail: moira.y.hargreaves@btinternet.com (or write to the address given above left.)

Copy deadlines

Spring Bulletin	15 January
Autumn Bulletin	05 June